

PAT-NO: JP411001005A  
DOCUMENT-IDENTIFIER: JP 11001005 A  
TITLE: INK-JET RECORDING APPARATUS  
PUBN-DATE: January 6, 1999

INVENTOR-INFORMATION:

NAME

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INT-CL (IPC): B41J002/18, B41J002/185

ABSTRACT:

PROBLEM TO BE SOLVED: To eliminate an ink-absorbing member, store a large amount of waste ink and reduce costs, by setting a waste ink tank main body having an upper opening sealed by a gas-permeable and liquid-shutting sheet to a case storing a suction pump for ink from a recording head.

SOLUTION: A case 1 has a recording head 3 and a cap member 8 sealing a nozzle opening of the recording head 3 at an upper space. The cap member 8 is connected to a suction opening of a suction pump 9 via a flow path. A waste ink tank 10 is disposed under a substrate 2 and connected to a discharge opening of the suction pump 9 via a tube 11. A material sheet passing an ink solvent steam and shutting an ink solvent is capped at an upper face of a main body of the waste ink tank 10. A peripheral edge is fused liquid-tightly. A waste ink flowing into the waste ink tank 10 is heated by

exhaust heat, so that  
the solvent is evaporated and diffused into the atmosphere.  
As a result, the  
volume of the waste ink becomes considerably small. Even  
when the waste ink  
tank 10 is inclined, the waste ink is prevented from  
flowing outside.

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Abstract Text - FPAR (1):

PROBLEM TO BE SOLVED: To eliminate an ink-absorbing  
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head.

Abstract Text - FPAR (2):

SOLUTION: A case 1 has a recording head 3 and a cap  
member 8 sealing a  
nozzle opening of the recording head 3 at an upper space.  
The cap member 8 is  
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## Disclaimer:

This English translation is produced by machine translation and may contain errors. The JPO, the NCIP, and those who drafted this document in the original language are not responsible for the result of the translation.

## Notes:

1. Untranslatable words are replaced with asterisks (\*\*\*\*).
2. Texts in the figures are not translated and shown as it is.

Translated: 01:46:01 JST 03/15/2006

Dictionary: Last updated 03/03/2006 / Priority:

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FULL CONTENTS

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## [Claim(s)]

[Claim 1] The print station equipped with the ink-jet type recording head, the cap member which closes said recording head, [ and the box which accommodates the suction pump which is open for free passage to this cap member, and attracts ink from said recording head ] Ink-jet type recording equipment which the upper surface closes with the sheet which prepares the main part of a waste ink tank by which the opening was carried out, and which has breathability for said opening and both has \*\*\*\*\*, and accommodates the waste ink from said suction pump in said main part of a waste ink tank.

[Claim 2] Ink-jet type recording equipment according to claim 1 with which said sheet consists of porosity material of ultra-high-molecular-weight-polyethylene resin or 4 fluoridation resin.

[Claim 3] Ink-jet type recording equipment according to claim 1 with which said main part of waste ink is constituted by said box and one.

[Claim 4] Ink-jet type recording equipment according to claim 1 with which the protective cover equipped with the ventilator is prepared in the upper surface of said sheet.

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[Detailed Description of the Invention]

## [0001]

[The technical field to which invention belongs] This invention relates to the waste ink tank of the ink-jet printer which accommodates the ink discharged by the cap member from the recording head.

## [0002]

[Description of the Prior Art] An ink-jet printer tends to produce a \*\*\*\* ball in a nozzle orifice, in order that viscosity may breathe out the quick ink of dryness and may form a dot in a recording medium highly comparatively from a very thin nozzle orifice. For this reason, what is called discharge recovery operation that contact the nozzle orifice side of a recording head in a cap member, and negative pressure is made to act on a

nozzle orifice, and discharges ink compulsorily from a nozzle orifice is needed. Moreover, the time of the beginning of using and what is called restoration operation that sucks a lot of ink out of a recording head in order to eliminate maintenance liquid and the air bubbles of a recording head when ink tanks are exchanged are needed. Thus, the discharged ink will be prepared in the box of the main part of a printer, and will be accommodated in the waste ink tank which equipped the inside with ink absorption material, such as felt. Although waste ink is held by the capillary tube power of ink absorption material and an outflow outside can be prevented by this, even when a waste ink tank inclines by movement of recording equipment etc. Many days, such as cutting processing of ink absorption material and charge, are needed, it cannot absorb the ink for real volume of ink absorption material, but the capacity of a waste ink tank becomes large it not only causes a cost rise, but, and there are many problems of a printer being enlarged.

[0003]

[Problem to be solved by the invention] It is offering the ink-jet type recording equipment which this invention's is made in view of such a problem, and the place made into the purpose can make ink absorption material unnecessary, and can accommodate a lot of waste ink, and can aim at a cost cut.

[0004]

[Means for solving problem] In order to solve such a problem, it sets to this invention. The print station equipped with the ink-jet type recording head, the cap member which closes said recording head, [ and the box which accommodates the suction pump which is open for free passage to this cap member, and attracts ink from said recording head ] The upper surface closes with the sheet which prepares the main part of a waste ink tank by which the opening was carried out and which has breathability for said opening and both has \*\*\*\*\*, and the waste ink from said suction pump was accommodated in said main part of a waste ink tank.

[0005]

[Function] If it is when the solvent of maintenance liquid or waste ink became steam, passes a sheet, and is diffused by the atmosphere, and only formed elements, such as paints of waste ink and dye, remain and a waste ink tank is leaned, an outflow outside is prevented with a sheet.

[0006]

[Working example] Then, based on the example illustrating the details of this invention, it explains below. Drawing 1 shows one example of this invention, and [ the box 1 of a printer ] The carriage 5 which is divided into up space and lower space by the substrate 2, and carries the recording head 3 and an ink cartridge 4 in up space, and the print station which consisted of motor 7 grades which make this reciprocate along with a platen 6, The cap member 8 which closes the nozzle orifice of the recording head 3 at the time of un-printing is arranged.

[0007] It connects with the suction mouth of the suction pump 9 through the channel which is not illustrated, and the cap member 8 receives the negative pressure from the suction pump 9 at the time of ink restoration and discharge capability recovery.

[0008] On the other hand under the substrate 2, the waste ink tank 10 by which this invention is characterized is installed, and the other end of the tube 11 linked to the discharge mouth of the suction pump 9 is connected.

[0009] In addition, a mark 13 shows a drive circuit for the flexible cable with which the mark 12 in a figure

transmits a signal to the recording head 3 again, respectively.

[0010] Drawing 2 is what shows one example of the above-mentioned waste ink tank 10. The upper surface of the main part 20 of a waste ink tank in which the upper surface carries out an opening is made to penetrate steam of an ink solvent. And the sheet 21 which consists of material which prevents an ink solvent, for example, the gas permeability sheet which consists of 4 fluoridation resin, the porous sheet (the "\*\*\* lap" (registered trademark) by NITTO DENKO CORP.) of ultra-high-molecular-weight-polyethylene resin etc. is put, and it will be in a fluid-tight state about a periphery -- as -- the up periphery 20a of the main part 20 of a waste ink tank -- heat welding -- ultrasonic welding is carried out and it is constituted.

[0011] The protective cover 22 which has Window 22a, 22a, and .... is formed in the upper surface of the sheet 21. In addition, the mark 23 in a figure shows a connection mouth with the tube 11 from the suction pump 9.

[0012] In this example, when using the recording head 3 for the first time, and in canceling a \*\*\*\* ball, the nozzle orifice of the recording head 3 is closed by the cap member 8, the suction pump 9 is operated, and it sucks ink out of the recording head 3 compulsorily.

[0013] The maintenance liquid and the air bubbles with which the recording head 3 was filled up by this operation at the time of factory shipments, and the ink dregs adhering to a nozzle orifice are discharged by the waste ink tank 10 from the connection mouth 23 via a tube 11 with ink.

[0014] The maintenance liquid which flowed into the waste ink tank 10, and waste ink are heated in response to exhaust heat of the power supply unit and motor 7 which are not illustrated, and evaporation of an ink solvent is promoted. Thereby, it becomes steam, a sheet 21 is passed, it is diffused by the atmosphere, only formed elements, such as paints of waste ink and dye, remain, and the volume of the solvent of maintenance liquid or waste ink of the whole waste ink reaches to an extreme and decreases.

[0015] On the other hand, when the waste ink tank 10 is leaned by movement of a printer etc., even if it is, it can prevent that waste ink flows out outside with the sheet 21 of \*\*\*\*\* which covers the main part 20 of a waste ink tank.

[0016] In addition, although the main part of a waste ink tank was constituted as a container of another object in the above-mentioned example Even if it forms the annular convex object 25 in the bottom of the box 1 of a printer by injection molding etc. with a box 1, and it constitutes the main part 26 of a waste ink tank, as shown in drawing 3, and it closes the opening of this with the sheet equipped with gas permeability and \*\*\*\*\* , it is clear to do the same operation so.

[0017] According to this example, the bottom of a waste ink tank can be shared with the bottom of the box 1 of a pudding tongue, height can be made low, and a miniaturization and a cost cut can be aimed at.

[0018]

[Effect of the Invention] As mentioned above, the print station equipped with the ink-jet type recording head in this invention as explained, [ the box which accommodates the suction pump which is open for free passage to the cap member which closes a recording head, and a cap member, and attracts ink from a recording head ] Since the upper surface closes with the sheet which prepares the main part of a waste ink tank by which the opening was carried out and which has breathability for an opening and both has \*\*\*\*\* and the waste ink from

- a suction pump was accommodated in the main part of a waste ink tank. The miniaturization of the box of recording equipment can be attained that the atmosphere is made to diffuse by making a solvent into steam among maintenance liquid or waste ink, and what is necessary is to accommodate only formed elements, such as paints and dye, therefore, using the capacity of a waste ink tank effectively, being able to use ink absorption material as unnecessary.
- [0019] Moreover, if it is when a cost cut can be aimed at could be using the \*\*\*\* cost of materials and a man day as unnecessary at charge of ink absorption material and a waste ink tank is leaned further. It can cover with a sheet and the outflow to the exterior of waste ink can be prevented certainly, and since processing of used ink absorption material moreover becomes unnecessary, the cost of waste disposal can be lowered.
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[Brief Description of the Drawings]

[Drawing 1] It is the figure in which fracturing some boxes and showing one example of the ink-jet type printer equipped with the waste ink tank of this invention.

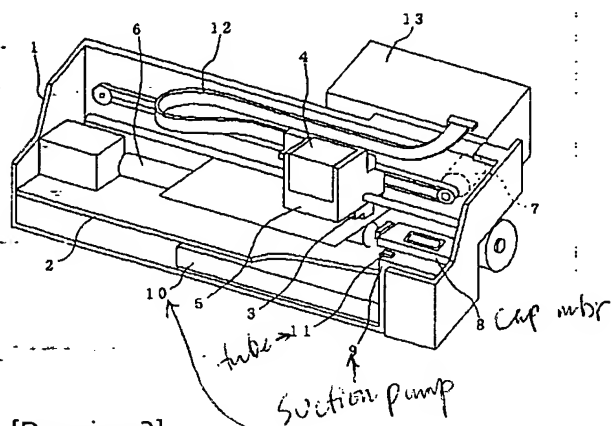
[Drawing 2] Figure (b) and (b) are the perspective views and sectional views showing one example of the waste ink tank of this invention.

[Drawing 3] It is the perspective view showing other examples of this invention with the structure of a box.

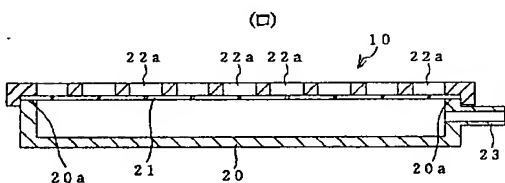
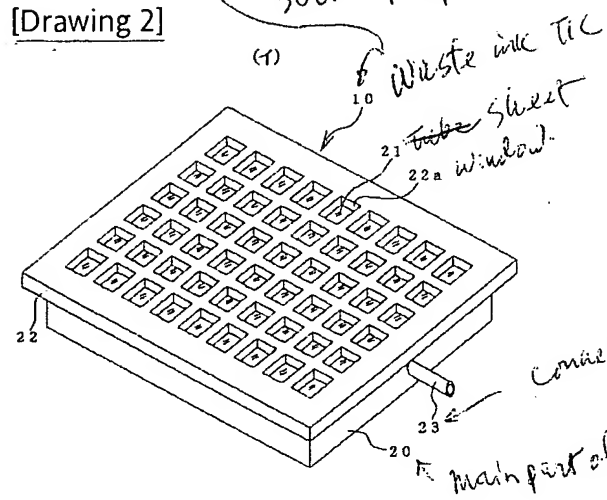
[Explanations of letters or numerals]

- 1 Box
  - 2 Substrate
  - 3 Recording Head
  - 4 Ink Cartridge
  - 5 Carriage
  - 6 Platen
  - 7 Motor
  - 8 Cap Member
  - 9 Suction Pump
  - 10 Waste Ink Tank
  - 11 Tube
  - 20 Main Part of Waste Ink Tank
  - 21 Sheet
  - 22 Protective Cover
  - 22a, 22a Window
- 

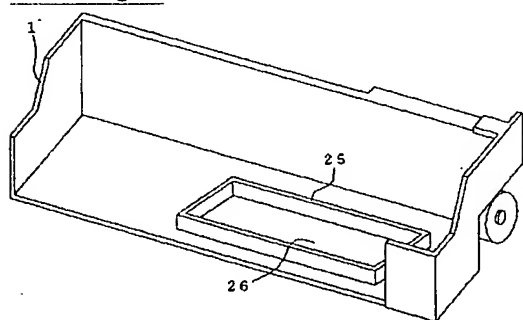
[Drawing 1]



[Drawing 2]



[Drawing 3]



[Translation done.]